

Diethylbenzene-rich Streams Category - Comments of Environmental Defense

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Environmental Defense appreciates this opportunity to submit comments on the robust summary/test plan for Diethylbenzene-rich Streams Category.

The American Chemistry Council has prepared a well-written test plan for a proposed diethylbenzene (DEB)-rich streams category. While a category classification for these streams makes sense because they are complex mixtures, we do have some concerns. These streams arise during the production of ethylbenzene as a consequence of continued alkylation of ethylbenzene. The streams are mixtures of DEB isomers and numerous other compounds including triethylbenzenes, polyethylbenzenes and naphthalene. The DEB streams are comprised of 87-99% DEB's. Individual isomers include 1,2-DEB, 1,3-DEB and 1,4-DEB.

The sponsor proposes additional testing for a number of physiochemical parameters, water solubility, and photodegradation for two DEB rich streams. We agree with this proposal especially in regards to the polyethylbenzene stream, which is more likely to be resistant to degradation and more likely to bioaccumulate.

The sponsor contends that existing data are adequate to fulfill health effects requirements for the HPV program. The basis for this contention is that several studies have been conducted on mixed DEB's as well as individual DEB isomers. In some cases these studies are difficult to evaluate because the composition of the mixture is not known although we assume that 1,2-DEB, 1,3-DEB and 1,4-DEB are the main constituents. Of particular concern is the pronounced neurotoxic response exhibited by rats administered 1,2-DEB. This response was not observed following equivalent and higher doses of 1,3-DEB and 1,4-DEB. Hydroxylation of the ethyl side chain appears to confer neurotoxicity to 1,2-DEB. This neurotoxicity is manifested by weakness in the hind limbs, disturbances in gait, and alterations in several nerve conduction parameters. These effects may be permanent because recovery is incomplete 8 weeks after exposure is terminated. We agree that existing studies, including both oral and inhalation routes of exposure are adequate to fulfill the requirements of the HPV program for repeat dose studies, but given the pronounced neurotoxicity in rats, we are concerned with the safety of workers potentially exposed to DEB-rich streams. Is there an established PEL and TLV for these agents in the workplace and are there any data on air levels in the workplace or blood levels of workers? Although not required by the HPV agreement, this information is important from a public health perspective.

Existing developmental toxicity studies are adequate. However, we recommend that additional genetic and reproductive toxicology studies be conducted. The reason for this recommendation is that the existing studies were conducted using mixed streams of unknown composition or 1,4-DEB. The neurotoxic isomer, 1,2-DEB was not tested in these studies. Since this isomer exhibits a different pattern of toxicity than the other isomers, it should be tested separately in reproductive and genetic toxicity studies.

Thank you for this opportunity to comment.

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